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Foot-and-Mouth Disease: Its Epizootiological Aspect*

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The character and behaviour of the virus of foot-and-mouth disease represent one of the most interesting and complex problems of epizootiology which have been studied intensively on the Continent of Europe, in this country and elsewhere, and as a result, our knowledge has been much increased during the past quarter of a century.

The discovery in 1920 by Vallée and Carré of two immunologically different types (O and A) was of outstanding importance; later, a third type (C) different from the other two types, was identified. So far, no further type has been found in Europe but work at Pirbright with virus of foreign sources suggests that the three common types do not exhaust the list. In the course of typing viruses obtained from the field, it is occasionally observed that a virus recently recovered does not correspond completely with any one of the stock types in the laboratory, but after a number of passages it conforms fully to one of the recognised types. Such an observation naturally prompts the question whether the types are fixed or whether this is not an indication of mutation. Indeed, mutation within the known range of plurality was suggested by Manniger[1] in 1931, but, on the other hand, stock strains have maintained their characteristics unchanged in the laboratory for periods as long as 25 years, and no virus of any type has been known to assume the properties of one of another type.

The differences between the three types are solely immunological and they cannot be appreciated clinically. The different features which can be noted in the course of the disease in a number of centres of infection are not to be associated with one type of virus or another; indeed, any one type may show over a period of time and in varying circumstances a variety of characteristics, which are related to the strain and not to the type. The distinction between type and strain of type must be emphasised. Whilst the immunological types are probably fixed, all the clinical and some of the epizootiological variations seen in the course of disease in different invasions are due to strains possessing modifications of a type in its non-essential characters. These non-essential characters include adaptation or, more correctly, partial adaptation to certain species of animals and virulence.

Among domestic stock, cattle, sheep, goats and swine are susceptible, and among wild animals, ruminants, swine and even some unrelated species such as rodents. It is sometimes observed in the field that a strain of virus appears to show a predilection for a particular species of domestic animal though given time and opportunity it will affect animals of other species. Much more commonly, however, animals of all the susceptible species will become affected if exposed to infection.

With regard to the virulence of the virus of foot-and-mouth disease, the high degree of susceptibility of animals in Britain in consequence of the absence of endemic disease and therefore of acquired immunity, enables interesting observations to be made on the varying degrees of virulence of strains. Though generally all stock is equally susceptible, some viruses appear in the field to have longer periods of incubation than others. Virulence may be measured in different ways or perhaps it would be more correct to say that several qualities are embraced in the term. One strain may have a tendency to spread slowly among susceptible animals, another may show a remarkable diffusibility, whilst a third may prove deadly to an unusual degree among adult animals. These are all dangerous or potentially dangerous in different ways; the slow-spreading virus may acquire an exalted capacity to infect by means of passage through different species of animals; the highly diffusible virus, unless promptly eradicated, will spread rapidly over very large areas; whilst the fatal form causes additionally heavy losses in those countries where the disease is dealt with by isolation. I say "dealt with" advisedly, for isolation is not a method of getting rid of the disease. So readily is infection carried mechanically by persons, birds, vermin, etc., that it is very hazardous to attempt to confine the disease even to a single farm and the risk of widespread disease increases as the number of infected foci rises.

Given the fact, as stated earlier, that disease is not endemic in the British Isles, the question naturally arises, how is infection brought to these shores? The answer may be sub-divided under three headings:

(a) the introduction of infection by untraced means,
(*b*) the importation of diseased animals, and
(*c*) the introduction of infection by chilled or frozen meat imported from infected countries.

I propose to illustrate the subject by explaining the circumstances in which disease has occurred in this country in recent years; accordingly the sequence of these means of introduction of virus is based on the sequence of their occurrence.

(*a*) *The introduction of infection by untraced means.*—Outbreaks occur in this country in which no obvious channel of infection can be determined. Our insular position eliminates the day-to-day traffic in persons, animals and goods which cannot be effectively controlled over land frontiers. It is obvious that land frontiers form no barrier to the spread of foot-and-mouth disease, and we know to our cost the Channel and even the North Sea can be overcome; the location of outbreaks with a negative history of origin suggests that the European Continent is the source of infection. A typical illustration of this is the series of outbreaks which occurred in the eastern and south-eastern counties and in the counties of Dorset, Hampshire, Somerset and Wiltshire, during the autumn of 1937 and the early months of 1938. In this series[2] there occurred 249 outbreaks in which the disease resembled that then raging in France and the Low Countries and which was destined to ravage Central Europe, and it also conformed in type (Type O). In parenthesis it may be of interest to note that this infection was introduced into France in April, 1937, through the importation of sheep and swine from Morocco where it is said to have presented no unusual features. The diseased African sheep and swine were distributed in France where it was soon seen that the virus possessed remarkable powers of diffusion. It is thought that an exaltation of virulence took place early after France became involved, and it may be that this was due to the rapid passage of disease among sheep and pigs under the cramped conditions of the sea voyage and the further passage to bovines during the course of distribution in France. The story is by no means unique but deserves the mention of a few statistics to exemplify the potentialities of the virus of the disease. The whole of France was involved in a few weeks. By the end of 1937, there were 63,000 outbreaks in Belgium. During 1938, more than 600,000 outbreaks occurred in Germany, the losses from which were estimated at the equivalent of more than 80 million sterling. Denmark, Poland and Czechoslovakia became involved in turn and the further march of the epizootic was obscured by the outbreak of war.

There is no doubt that the disease in England originated on the Continent, but what is uncertain is the proportion of outbreaks which were initial and the proportion that arose as secondary. Possibly two-thirds, or more, of these outbreaks were due to spread within the country.

The first of these outbreaks was notified on October 16th, 1937, and it is significant that in this month in other years, outbreaks of obscure origin have arisen. This time factor, together with the localities involved, the arrival of flocks of migrant birds (starlings especially) and the routes of migration, all suggest strongly that these birds are mechanical carriers of infection. In the great majority of such cases, the initial outbreaks occur among cattle at grass. Incidentally, there is a sharp contrast in the course of the disease in England where prompt notification was followed by the rapid application of stamping-out measures and rigid control of movement of stock and its course on the Continent where the authorities were powerless to check its dissemination.

Whilst the cumulative experience over a number of years leaves little doubt that birds may introduce disease, this factor does not operate every year as obviously the danger is related to the disease position at the resting places of the migrant flocks on their way to this country, and as this varies from year to year, so also does the incidence of such outbreaks vary in this country.

On the other hand, it has been suggested that there are other means whereby infection is introduced from the Continent, but the history of disease in this country does not support these suggestions.

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(*b*) *Importation of diseased animals.*—The prohibition of importation of livestock from infected countries reduces this danger to a minimum. Normally, the importation of cattle, sheep and swine is restricted to Ireland, the Isle of Man, the Channel Islands and Canada. Occasionally, disease has been introduced into Great Britain from Ireland through the shipment of animals after the appearance of disease in that country, but before the facts became known to the authorities, when further shipments were, of course, suspended during the emergency. The last occasion in which disease was so introduced was in 1942. Disease was found in two landing places in this country, but the prompt application of restrictions prevented the movement of stock out of the ports and disease was confined to those two landing places.

(*c*) *The introduction of infection by chilled and frozen meat imported from infected countries.*—Observations in the field having indicated the association of initial outbreaks with kitchen waste and more directly, on one occasion, with imported carcases, experiments were conducted at Pirbright, the result of which proved the possibility of survival of virus in carcases held at the refrigeration temperatures at which the trade in imported meat is conducted. The virus was shown to survive under chilled conditions for as long as the meat is marketable under those conditions and for 100 days (not end-point) when the meat is frozen. During the war, all meat is imported in the frozen state or processed.

To exemplify this risk, I shall discuss the history of the initial outbreaks that occurred during 1944, when an exceptionally large number of invasions were recorded. Actually the number is 93, of which 13 occurred during the months of January to July inclusive, the number rapidly rising in August and continuing at a high level until the end of the year and later. Broadly, these outbreaks were characterised by common features and there was a marked absence during the winter months of the type of outbreak discussed earlier, the origin of which is attributable to Continental sources.

The outstanding feature of these 93 outbreaks is the fact that in 78 cases the disease started in pigs. In most of these cases, pigs were the only animals on the premises.

In practically every case, raw swill was brought to the premises for pig feeding, where in accordance with the Regulations it should have been boiled for an hour before being fed, and animals should not have been allowed access to it before it was boiled. Swill from various sources was concerned in these initial outbreaks; swill from canteens, restaurants, private households and Service depots, but swill from United States camps was not incriminated. The United States establishments draw their meat supplies from the North American Continent, where foot-and-mouth disease does not exist. But whilst kitchen waste, which includes scraps of meat and vegetable trimmings which so often are in contact with joints of meat and meat juices in kitchens, serves as a vehicle of infection, the risk of introducing virus in meat imported from infected countries is not confined to the feeding of improperly treated swill to pigs as is demonstrated by the occurrence of a number of outbreaks on the premises of butchers who at the time were distributing South American meat. In a few of these cases, the disease did not start in pigs, but in cattle which had access to meat-wrappers, etc., in the yards.

The activities of the Waste Food Board of the Ministry of Supply —with which are associated the Ministries of Food and of Agriculture and Fisheries—have resulted in the establishment, in populous areas, of central establishments where swill is either concentrated or boiled and then distributed to pig keepers. It is merely in accordance with expectation that the feeding of centrally processed kitchen waste has proved to be safe and the absence of foot-and-mouth disease among pigs fed on swill distributed from these central treatment plants testifies to the signal service rendered to the agricultural community and to the nation by the provision of a very large and safe tonnage of pig food, much of which in its initial state, as judged by the use of swill taken to farms in the raw state, was capable of setting up disease. It is to be borne in mind that when raw swill is brought to a farm, its cooking is not the only safeguard to protect animals, and there are many ways in which infection may be conveyed to stock unless all necessary precautions are taken. Hence, the principle of central treatment is essentially sound.

There are two further pieces of evidence. In certain parts of the country, where fat stock is produced in sufficient quantity to provide the meat ration for the local population, a minimum of imported meat is supplied with the object of economising transport. In these areas there has been a practically complete absence of outbreaks. Also a fatal form of the disease occurred in some localities in South America and was also found in this country, when a number of adult cattle died. This virus was identified as Type C, and, fortunately, though lethal, showed little power of diffusion.

The position may be summed up as follows:—

It has been shown experimentally that the virus will survive for months in frozen carcases:

During 1944 a large number of outbreaks occurred among pigs fed on kitchen waste and outbreaks have occurred, not always among pigs, on the premises of butchers distributing imported meat.

During the same period, there has been a virtual absence of disease in those limited parts of the country which are chiefly self-supporting in meat, and on farms where only centrally sterilised kitchen waste was used for feeding pigs.

The association of disease with the imported meat trade either directly on butcher's premises or indirectly by the taking of swill in the raw state to piggeries indicates without any question the source of infection during the past year.

The only counties infected with foot-and-mouth disease from which any meat was imported into Great Britain during the period under review were the South American Republics, and there seems no room for doubt that it was from these countries that our repeated infections were derived.

Many of these initial outbreaks occurred in piggeries in built-up areas, and, conquently, because of the paucity of livestock in such districts, there was little opportunity for the disease to spread, and also relatively very few markets were involved. Other centres, however, proved more troublesome. During the year all three types of virus were identified.

The Control of Disease by Prophylaxis

In a country where the disease is not endemic and where invasions can be stamped out, the slaughter policy is obviously the most economic to adopt in order to avoid the enormous losses in milk and other animal products which such a highly contagious disease is capable of inflicting upon a nation, but a country with land frontiers when the disease exists on the other side of a line, often arbitrary, is exposed to such risks of infection and repeated reinfection that eradication becomes actually impossible. It is, therefore, not surprising that the mitigation of its losses should be sought in prophylactic measures. The earlier efforts were made with protective serum, either convalescent serum or hyperimmune serum, and at later stage methods of vaccination have been devised.

1. Convalescent Serum.

Cattle which have fully recovered from a recent attack of disease are bled on the farms and the separated plasma, about four litres, is used in doses up to 400 c.c. for cattle, as an immunising agent. The effect is temporary, lasting about ten days, and the method has been used for the protection of animals already seriously exposed to infection or intended to be exhibited at shows or sent to market. The serum is monovalent.

2. Hyperimmune Serum.

This serum is extracted in the same way as convalescent serum, but unlike the latter, the blood is derived from cattle which have been infected with one or more types and subsequently reinfected to increase the potency of the serum. The donor animals must, therefore, be hyperimmunised in special establishments. The types of virus used may be selected according to those prevalent at a given moment and against which it is desired to protect animals for a short period. The maximum dose is 200 c.c. for cattle. These products are giving way in favour of vaccines.

3. Vaccines.

(*a*) The first method used on any scale in the field was the modification by Waldmann of the method originated by the Danish workers, Schmidt and Schmit-Jensen and Hansen[3]. Briefly, it consists in treating virus and epithelium recovered from the tongues of cattle by aluminium hydroxide and formalin, thereby rendering it innocuous.

The earliest application of this vaccine in Germany was made in 1938, and since then it has become the principal weapon for the control of disease in Germany and in other European countries.

Extensive arrangements are made for the housing of cattle to be infected as virus donors, and for the preparation of the vaccine. At first a monovalent (O) vaccine was produced, but on appearance of another type (A) in the field a bivalent vaccine was used. As the output increased it became necessary for technical reasons to reduce the valency to that of one type alone. In Germany, between February, 1938, and April, 1942, some 250,000 litres of vaccine were administered to about 4½ million animals. Waldmann claims that the immunity lasts for at least six months, and usually for eight months. During those four years, disease was reported within six months of vaccination on 814 farms out of an estimated number of about 460,000 treated herds, and in about 60 per cent. of these breaks, disease was due to the incursion of a type of virus different from that used in the preparation of the vaccine.

In the earlier days the vaccine was applied to bovines only, and it does not appear from the recent literature to have become the practice to vaccinate sheep or swine. Obviously, the German

authorities have been handicapped in the application of their preventive measures during the war, but they have operated on a very considerable scale and have protected the stock in the more vulnerable areas, according to circumstances. It may be by design that they have confined the work to cattle; it may be for technical reasons. Despite their efforts and the high claims made in favour of the process, it is nevertheless of interest and importance to note that during the years 1940 and 1941, when, presumbaly, facilities for the preparation of vaccine were at their maximum, there occurred in the Reich more than 89,000 outbreaks of the disease. This is certainly a great improvement on the position in 1938 which I have mentioned, but the 1938 position was exceptional, the wave of the epizootic had spent itself in Germany, and such waves do not reappear normally at such short intervals. In fact, when every allowance is made for the value of the vaccine and the difficulties created by war-time conditions, the wide use of vaccine in the most threatened localities did not prevent the occurrence of a large number of outbreaks. Further, it remains to be shown that it is possible to arrest an epizootic when the virus assumes, as it not infrequently does, a hyper-diffusible form.

(*b*) *Crystal Violet Vaccine.*—The first experiments with virus treated with the crystal violet dye were made in Switzerland by Graub[4] shortly before the war. After considering all the available data, including also other means of rendering the virus avirulent though possessing—so it was claimed—antigenic properties, it was decided to conduct experiments at Pirbright with virus treated with crystal violet and incubated for a few days at 37° C. It has been found that virus so treated is non-infective and induces a high degree of immunity lasting about six months or longer. The source of virus is the blood taken from reacting cattle at the time when it is at its highest concentration in the circulation. So far, experimental work has been confined to bovines, and as in the case of the aluminium hydroxide-formalin vaccine, little is known of its effects upon other species of animals. The crystal violet vaccine is being tried out in South America.

What is the future of vaccines? Authorities on the Continent are confident that the early compulsory and appropriate use of vaccine will control the spread of disease. If this hope is realised, our risks of invasion will be vastly reduced if full use is made of vaccine in those countries which have become a source of frequent infection of our herds and flocks. We in this country will watch with the keenest interest the further development of the use of prophylactic measures and their influence on the course of epidemics in countries which have been, and still are, a menace to the health of our livestock.

But vaccination can have no place side by side with a policy of eradication: to vaccinate stock against a type of virus which has been already identified is bound, sooner or later, to lead to disappointment, for the subsequent invasions may be of a different type and we have repeatedly encountered the presence of viruses of two different types in one locality. Over very large areas of territory one virus may be present alone in a given locality and its spread, without the intervention of another virus, may be fairly accurately determined. Such is not the case here where we are exposed to risks of introduction of disease from a number of countries and as has been established, all three types may appear in a short period of time. We should have to be prepared to protect stock against all three types, which would be a huge undertaking. Again, the immunity provoked by prophylactic means is not absolute and some animals develop masked lesions of the disease. While the significance of such cases is not known, such animals may be a grave danger in this country where the disease is not endemic.

Before closing, I would like to refer to the duties of the practitioner. You will know the serious responsibility imposed by law upon the owner or person in charge of animals. The law says that "he shall be presumed to have known of the existence of the disease or illness, unless he shows to the satisfaction of the Court that he had not knowledge thereof, and could not with reasonable diligence have obtained that knowledge"[5]. Clearly, if in the exercise of reasonable diligence he calls in a veterinary surgeon, the full responsibility for notification is passed to the practitioner, under the Foot-and-Mouth Disease (Amendment) Order of 1938. Mistakes in diagnosis have been made—I would give these words of advice: before arriving at a diagnosis of rheumatism or arthritis in swine, always examine the feet carefully: in making a *post-mortem* examination, whether in cattle or in swine, do not overlook the necessity for examining the mouth, tongue and feet. In any case of doubt, refer, as a matter of urgency, to the Divisional Office and disinfect boots and clothing before visiting other premises.

But, if I may say so, there are other responsibilities towards a client beyond the strictly legal ones. It has been shown abundantly how important swill may be as a vehicle of infection. When visiting a client, do not hesitate to look into his methods of boiling swill and particularly the manner in which the raw swill is disposed on the premises and handled before boiling. It may often be possible to render valuable service and do a good turn to the client who brings this potentially dangerous, though in these days very valuable, feeding stuff to his farm.

References

(1) Office International des Epizootics, Vol. V, No. 1.
(2) Proceedings under the Diseases of Animals Acts, 1937.
(3) *Rev. Immunol.*, T.II, 1936.
(4) *Schweiz. Arch. Tierheilk.*, LXXXI, 1939.
(5) Diseases of Animals Act, 1894, Sect. 57 (1).

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Discussion

Dr. G. O. Davies: When I was a final year student, I was privileged to attend a meeting of this Association in Manchester which was addressed by the late Sir Stewart Stockman, the then Chief Veterinary Officer of the Ministry of Agriculture. The subject of the meeting was Foot-and-Mouth Disease and the excellence of the address and subsequent discussion left a lasting impression on my memory. To-day, after an interval of over 20 years, history is repeating itself and we are honoured this afternoon by the presence of the present Chief Veterinary Officer, Sir Daniel Cabot. The subject remains the same time-honoured one, but the aspect under discussion is not, as it was then, whether the slaughter policy can be justified, but a review of the epizootiology of the disease and the methods of prophylaxis at our disposal.

Before proceeding with the subject matter of the paper, I would like first of all to express my personal thanks and appreciation to Sir Daniel for the very interesting and instructive address which he has given us. Not only that, but I would thank him, too, for coming here in person to enter into the subsequent discussion, particularly in present circumstances when travelling is anything but a pleasure and when his time must be very fully occupied with the many current problems of national importance.

I must also express to you, Mr. President, my appreciation of the honour you have done me in asking me to open the discussion this afternoon. Foot-and-mouth disease is a subject for which I have always had a "soft spot," for it was the disease into which I plunged at the beginning of my professional career. And what a subject to plunge into!

As Sir Daniel said in his opening remarks, "the character and behaviour of the virus of foot-and-mouth disease represent one of the most interesting and complex problems of epizootiology." When I first came into contact with the disease only two types of virus were recognised. These were known as Vallée O and A (named, I believe, after the department Oise and the Ardennes in which they were found). Later (1928) two German investigators, Waldmann and Trautwein, observed that they had found three types which they called A, B and C, but at that time there was nothing to indicate whether any one of these types was the same as Vallée O or A or whether it meant that there were now five types in being. So the research staff of the Foot-and-Mouth Disease Research Committee set to work to sort them out by cross-immunity tests and finally, in agreement with other workers, concluded that Waldmann's A and B corresponded to Vallée's O and A, but that C was a new type. That was how we came to recognise the three types, A, O and C, which are still the only types so far as Europe is concerned, but, as Sir Daniel has stated, it may still be that these three do not exhaust the list. It is important to remember, however, that there are no appreciable clinical differences between the diseases set up by these different types, but when we turn to the field of immunisation each is distinct and any vaccine prepared would need to contain a proportion of each type. Vaccine preparation with viruses is difficult enough when only one immunological type is in being, but when there are three, and possibly more to come, the problem becomes much more complicated.

Not only are there three different types, but Sir Daniel has now told us that there are different strains within the types and that it is with these different strains that the clinical and some of the epizootiological variations are associated.

To me, one of the most important variations which he has mentioned is the variation in virulence and the recent appearance in this country of an unusually lethal strain belonging to type C. I would like to hear from Sir Daniel whether he considers this form to be the malignant form of foot-and-mouth disease which has been described in many foreign countries. From accounts which I have read of their occurrence abroad, there appears to be some uncertainty and variation even in the malignant form. Some describe it as a form which occurs chiefly in young animals and sucklings and only occasionally in adult animals. Some, too, describe death as occurring in the early stages of the disease, whereas others state that the malignant character of the disease does not appear until the period of convalescence. I would be very grateful to the essayist if he would give us a little more information about this lethal form as I feel that a history of sudden death in the early stages of the disease, if such is the case, is hardly likely to arouse a suspicion of foot-and-mouth disease in the mind of a practitioner. I note, too, that this lethal strain seems to be linked with a low power of diffusibility. That is entirely the reverse of what one would expect, as one usually associates increased lethal power with increased virulence due to repeated and frequent passage through susceptible animals. But that does not appear to be the case with this strain. Perhaps it is a case of an unusual degree of susceptibility in the animals concerned or that environmental factors play a part. Another point on which I should like some information if it is available, which is probably doubtful, is whether such fatal cases reveal the myocardial lesions which we read about but never have an opportunity to study.

Turning to epizootiology, I see that Sir Daniel groups the portals of entry of the disease into this country under three headings. With regard to its occasional introduction by the importation by diseased animals, there can be no doubt, and the same remark seems to apply in relation to the introduction of infection by chilled or frozen meat from infected countries. The laboratory evidence of the survival of the virus in the bone-marrow, etc., of animals slaughtered in the earlier stages of the disease supported by the evidence which we now have of the incidence of disease in pigs fed raw swill containing meat scraps from imported countries, places this source of infection beyond dispute. I was particularly interested to hear that swill from United States camps had not been incriminated and that this was explained by the fact that their meat supplies came from North America, where the disease does not exist.

With regard to the third portal of entry, namely by untraced means, in which birds are blamed, I am afraid I am a little uncertain. I must confess to having always been somewhat sceptical about the part played by birds in the transmission of the disease, but it seems to me that I may now require to modify my views, as the essayist's evidence, circumstantial though it is, seems very strong. Of course it may be that I am somewhat prejudiced with regard to

birds, because whenever I think of them my mind always goes back to the days when, at Weybridge, we were endeavouring to carry out transmission experiments with sea-gulls for the late Sir Stewart Stockman. Without going into details I can assure you that the sea-gull is not the most amenable of experimental subjects!

To revert to this unsolved portal of entry from the continent, the fact still remains, whether we accept the bird theory or not, that some explanation is required for the occurrence of outbreaks in southern England which seem to coincide with those on the continent. If birds are responsible, there seems to be little that we can do about it and we shall have to face the fact that, so long as there are migrant birds, and so long as our continental neighbours continue to be ravaged by foot-and-mouth disease, we cannot hope to be free from occasional visitations by the disease. Similarly, with regard to imported meat, so long as we have to rely on meat imported from disease-ridden countries, there will always remain the risk of an occasional outbreak. How then is this risk to be reduced? To my mind, our hope rests on prophylactic methods, not in our country, but in the countries whence the disease comes to us. The use of vaccines and sera in this country cannot in my opinion ever have more than a very limited application. It is conceivable that when an efficient, non-infective, polyvalent vaccine is available it could be used prophylactically, in exceptional circumstances, such as for the protection of very valuable animals, but the widespread vaccination of all susceptible stock at intervals of perhaps a year or so is, to my mind, too formidable an undertaking for more reasons than one. Particularly is this the case in a country like ours where the disease is not enzootic and where invasions can be stamped out by a slaughter policy. In the case of countries where the disease is enzootic and where land frontiers make the slaughter policy impracticable or uneconomic all hope must rest on vaccination.

Our interest then in vaccines and sera is primarily an indirect one. The sooner an efficient vaccine becomes available and is used in countries whence the disease comes to us the sooner will be the day when the disease ceases to be introduced either by meat, birds or other means. In this connection I was very interested to hear that the new crystal violet vaccine is being tried in South America. This, it is hoped, will be the solution of the imported meat problem.

Professor J. G. WRIGHT said that he had been most fascinated by Sir Daniel's paper. He spoke as one who, for the greater part of his career, had been living in the seclusion of a veterinary college and thus removed from the disease as it occurred naturally. For him, Sir Daniel had to-day made the disease a reality and he believed that he had also done this for those students who were present that afternoon. He had brought them to realise that foot-and-mouth disease was something which occurred not only in the text-books but was a very real disease which had to be combated. He felt that he, personally, would now be more able to reply to the views expressed by laymen, particularly in regard to the slaughter policy. He often found himself called upon to defend the policy of the Ministry and he could now say that although Sir Daniel had not spoken directly of that policy he had vindicated it.

Even when it was possible to make vast quantities of serum, and he had himself seen the mass production of it at the island of Reims in Germany, the amount thus produced would be but a drop in the ocean in dealing with an outbreak due to a highly diffusible strain. He had noted that the virus there used was not a very virulent one and wondered what was the potency of the serum produced. There had indeed been a big breakdown later in serumised animals.

Mr. C. F. SHAWCROSS had been very interested in the paper, particularly in the parts dealing with prophylaxis and in regard to the role of practitioners. The practitioner had a great responsibility, for on him depended early diagnosis and control. The farmer, when he rang up about his ailing cow which "had a sore throat" or "was lame," did not know that it had foot-and-mouth disease. The practitioner, unsuspectingly, arrived unprepared in regard to his clothing, etc. The Foot-and-Mouth Order placed a great responsibility on the practitioner because he was expected to diagnose the condition on the spot; this might not be difficult in a typical case but, in cases of doubt, he felt that it should be possible to co-operate with the whole-time Ministry staff without putting restrictions on the premises immediately.

Mr. E. R. CALLENDER assured Mr. Shawcross that the whole-time staff of the Ministry were always willing to co-operate with practitioners in cases where any doubt existed and had, in fact, frequently done so. He expressed his appreciation of a very excellent paper. It seemed to him rather curious that when disease became widespread through dilatoriness in reporting or involvement of a market, people were apt to ask, "what have the Ministry been doing to allow it to get away?" If, on the other hand, they were sufficiently fortunate to confine the disease to the initial outbreaks then the wise-acres shook their heads and said "This cannot be foot-and-mouth disease, it hasn't spread."

One factor in the spread of disease which was not so amenable to control was the activity of dealers. Whilst some of these rendered useful service to the community there were a good number who rendered no service whatsoever. He mentioned a recent experience in tracing a £10 cow which, after prolonged travels through two counties through the hands of several dealers, had eventually been sent for slaughter. How much better if this animal had been sent direct for slaughter in the first instance.

Mr. A. J. WRIGHT had been most interested in the three methods of introduction of the disease enumerated by Sir Daniel and particularly in the references to birds—the speaker had mentioned starlings. As a student he had often watched the activities of sea-gulls over the east coast and over the waters which separated this country from the Continent. Personally he was satisfied that they were a great source of danger. They fed at the knackeries and tanyards on the Dutch and French coasts and then followed the boats right across. Having watched them on this side, spewing up casts in which he had been able to detect traces of bovine hair, etc., he was satisfied that there was a great risk of parts of contaminated carcases being thus brought across from the continent to this country.

He would like to ask Sir Daniel if he could help practitioners who had not seen the lethal type of the disease by indicating any symptoms for which they should be on their guard. In regard to the responsibility of the L.V.I., he always said, "In cases of doubt stay on the farm and get in touch with Divisional Office and the whole-time man will soon be there."

He thought that when a market was on the border of a recently defined infected area and calves were brought from outside the area without licence by farmers who were unaware of the restrictions, injustice was done if proceedings were taken. Would it not be possible to amend the Order so that these animals were retained in the market and slaughtered and no action taken against the owners?

Mr. H. SUMNER said that he, like Dr. Davies, recalled most vividly that memorable meeting when Sir Stewart Stockman came at the end of the holocaust of 1923 in order to justify the Ministry's slaughter policy. To-day no justification of that policy was necessary, but he would like to say how much he had enjoyed the paper and felt that the occasion compared most favourably with that earlier meeting.

He wished to stress only two points; firstly, he felt that it would be most helpful if practitioners were informed as soon as possible of outbreaks in their area and did not have to find out from the local press. Secondly, he wished that the Ministry could, with proper safeguards, allow students and junior practitioners to see cases of the disease in the field. It was impossible to gain a proper conception of the condition merely from specimens in bottles.

Mr. J. FRANCIS: He was very glad that Sir Daniel was addressing them to-day, both because of the intrinsic interest of the subject and because he thought it important that members of the Ministry's staff should frequently discuss problems of animal health with their colleagues. Just as ministers were subject to the criticism of Parliament so, he felt, officers of the Ministry should be ready to discuss policies for the improvement of animal health freely and frankly with other workers; only by this means could a scientific outlook be obtained and the adoption of autocratic and dictatorial methods prevented.

There was very little to criticise in the Government's foot-and-mouth policy, which was based on the method of slaughter, but it was interesting to see how the policy had developed. In 1865 this country was faced with a serious invasion of cattle plague. John Gamgee, who had long warned the country of the danger of importing live cattle from Europe, at once advised "stamping-out methods," but he was abused by medical men and others for his "unscientific" outlook and various remedies were tried. It was not until the stamping-out policy was adopted that the disease was brought under control.

Pleuropneumonia was of special interest because, like tuberculosis, it might run a chronic course and be impossible to recognise clinically; there is also a method of vaccination which is fairly effective experimentally. There was, therefore, about 1880, a great deal of controversy as to whether the slaughter policy or vaccination should be adopted. The disease had been rife in Holland and the evidence of Dutch experience is given in the Pleuropneumonia Report of 1888. After early attempts at vaccination a stamping-out policy was successfully adopted in that country and Dutch experts were firmly of the opinion that it was more efficacious than vaccination. It is well known that the stamping-out policy was successfully employed in Great Britain without any aids to diagnosis such as the complement fixation test. The disease still exists in Australia where vaccination has been adopted.

Rabies was also eradicated from Great Britain early in the 20th century, but was introduced again at the close of the last war only to be stamped out once more. The disease has not been controlled in France or the U.S.A. where the slaughter policy is not employed.

Glanders, another chronic disease in some ways resembling tuberculosis, was the scourge of town and, to a less extent, country stables for many years. William Hunting had to carry out a vigorous but protracted campaign in *The Veterinary Record* and in other ways to induce the Board of Agriculture to adopt a policy designed to stamp out glanders. When at last the control methods he advocated, which were based on the slaughter of horses reacting to the mallein test, were adopted, the incidence of the disease was steadily reduced and eventually eradicated.

It would be seen, therefore, that the slaughter policy had been peculiarly successful in these islands for eradicating a number of the most serious animal scourges—applied in the right way to diseases amenable to this method of control it is, contrary to views held by some people, the most scientific method of control we have. It is not suitable for the control of all diseases and has not been entirely successful in the control of foot-and-mouth disease, but that is due to the repeated reinfection of these islands.

There were still two diseases of livestock in Great Britain amenable to stamping-out methods—they were swine fever and tuberculosis. Obviously a slaughter policy for tuberculosis could not be introduced suddenly, but accredited areas should be established without delay where the incidence was low. He hoped some of them would live to see the day when the incidence of tuberculosis was being steadily reduced.

Sir Daniel had told them the cost of foot-and-mouth disease during the 1937 epidemic in Germany. He wondered if he could tell the meeting what the cost was during the same epidemic in Great Britain.

Major A. B. MATTINSON remarked that the migration of birds was a more or less constant factor and he wondered if there had been periods when the disease had ravaged the continent without appearing in this country.

Mr. H. H. BRASSEY-EDWARDS congratulated Sir Daniel on his clear and concise exposition of the subject. He spoke in the light of 35 years' experience in Kenya Colony, where his work had been chiefly on the control of contagious diseases—rinderpest, contagious pleuropneumonia, foot-and-mouth disease, etc. The difficulty which they had always come up against was the unknown factor—the method of spread and the best means of eradication.

The East African colonies were fortunate in that the form of foot-and-mouth disease encountered was extraordinarily mild; there occurred symptoms of very slight salivation and slight lameness and with a certain degree of mortality in calves. The latter was probably due to starvation. To practise any form of vaccination out there was useless, as was quarantine, for wild animals roamed freely about the farms. They had a system of notifying the disease, as a result of which milk and other products from infected sources were stopped and supervised.

Until a polyvalent vaccine which would convey a definite immunity was produced, it was useless to try to control the disease by this method. In early attempts to eradicate rinderpest, serum alone was used at 14 day intervals. Animals incubating the disease showed symptoms but did not die. Later the double incubation method, using blood and serum, was employed, but this only created new difficulties by transmitting piroplasmosis. Finally, a desiccated vaccine was produced, as a result of the use of which they were able to eradicate rinderpest. He felt that the control of foot-and-mouth disease must go through the same stages.

Finally, he wished to suggest that closer collaboration should be established with African and Continental research stations in regard to methods of eradication.

Mr. A. J. WRIGHT said that he would just like to add his support to Mr. Sumner's plea for early notification of outbreaks to practitioners. The matter had been raised by the N.V.M.A. He knew there were difficulties but hoped that these could be overcome and that either by the police or some other means all veterinary surgeons in an infected ara could be informed as soon as possible.

The Reply

Sir DANIEL CABOT said that he had been asked about the nature of the malignant form of the disease and was it due to Type C virus? In only one instance had the virus responsible for this form been typed, in an outbreak which occurred last year. In an outbreak reported in Italy after the last war the losses had been quite heavy, amounting to as much as 30 to 40 per cent. of adult cattle. It was said that the animals died from heart failure. He wished to emphasise that foot-and-mouth disease did kill, but usually it was only lethal in the case of very young animals—calves, lambs and piglings. Last year there had been losses in adult cattle in certain parts of South America, but, though these had been serious, they were not as heavy as in the outbreak mentioned in Northern Italy. It did not seem as if this form of the disease spread very extensively.

The virus of Type O which spread through Europe a few years ago was one which showed remarkable powers of diffusion, but, although it was not a lethal virus, *i.e.*, one which killed in the early stages of the disease, quite a number

of animals were afterwards left as wrecks with such conditions as arthritis, mastitis, etc. In the lethal form, animals sometimes exhibited signs of excitement and lesions were not always very profuse. He would stress the need for a careful *post-mortem* examination in a case where death occurred when the history was not satisfactory.

The points raised by Mr. Shawcross had been adequately answered by Mr. Callender. Divisional officers were only too pleased to see animals when there was any doubt about the condition; the sooner their advice was sought the better. Such cases should not be left for a few days to await developments. In regard to the responsibility of the practitioner, he wished to emphasise that is, the practitioner, was not expected in fact or by law to make a diagnosis. He was required by law to report to the police when he diagnosed or suspected the disease, but, in cases of doubt, the Divisional Office was at the service of the practitioner and very happy to collaborate.

On the question raised by Mr. A. J. Wright of animals appearing in markets soon after the restrictions had been imposed, he was sure that if a good case was made out the police would be reasonable.

Mr. Sumner, supported by Mr. Wright, had made an urgent plea for immediate notification of outbreaks to practitioners. As Mr. Wright had said, this had been raised by the N.V.M.A., but he had made a note of it and would look into the matter again.

He was interested in Mr. Francis's strong support of the slaughter policy and was quite sure that all would agree with the fundamental correctness of the direct method of dealing with contagious disease. To Mr. Francis's list he would add the case of the introduction of sheep pox from Europe. When this occurred all meat arrived in this country on the hoof and the only source of supply was the continent of Europe. In order to prevent the further introduction of the disease the authorities proceeded to impose an embargo on the importation of sheep from Europe. This was the first instance of such an embargo being imposed on grounds of disease.

Several speakers had spoken of birds as carriers of the disease. In this connection the type of outbreak to which he had referred occurred only in the south-eastern counties and the eastern counties up to the Humber and always during the months beginning October (round about the middle of that month). Nearly always the outbreaks occurred amongst cattle at grass. The important point was that in these outbreaks we were able to stop the disease spreading throughout the country, as it had spread from the south of France to the north and then eastwards, in which direction it was still moving up to the time information from the continent had ceased.

As regards the cost to this country of this epidemic, he could not make a definite statement, but it was probably in the region of £250,000.

In conclusion, he wished to say that it had afforded him great pleasure to discuss this subject that day; it was a fact that the more one studied the disease the less mystery there was about it.

MINISTRY OF AGRICULTURE NEWS SERVICE

Back to Sheep.—Many food problems will remain after the end of the war and one of them is bound to be shortage of meat. During the past 5½ years the necessities of war have led to a considerable reduction in the country's sheep population. With their removal it is hoped that there will be a large increase in sheep numbers. Not only will more sheep mean more meat, but they will help to restore to condition land that during the war years has been overcropped.

When farmers begin to expand their flocks, it is important that they should do so on the right lines. Before the war, especially in areas where grassland flocks were replacing arable, there was a certain amount of haphazard crossing. Grazing management was often poor, resulting in wide infestation with worms and other parasites. Sometimes insufficient attention was given to the choice of rams, the grading of lambs or the culling of the flock.

Advice upon these points can always be obtained from War Agricultural Executive Committees and during the coming months it is hoped that farmers will have the opportunity of attending demonstrations dealing with such points as breed of ewe, breed of ram, culling of the ewe flock before tupping time, sheep diseases and shepherding and that all-important question of market and what the consumer will want.

. . . . . .

Feathered Aces.—Few ornithologists would disagree with the assertion that the peregrine falcon is the fastest British bird, but as to the other places of honour opinions differ. There are those who would rank the black grouse second and the golden plover third, some who would reverse these placings, and some who would give them both to other birds.

The golden plover is remarkable for another reason, and although many kinds of birds have the same sort of ability, in this species it can perhaps be found in the greatest perfection. In the winter one may come upon a flock of golden plover numbering some scores or even hundreds of birds, and see them, in full flight, rise or dip, wheel or swerve or turn as one. Between bird and bird, right throughout the flock, there is no perceptible time-lag; all act in concert with a precision of movement that no company of soldiers of any nation could hope to emulate, each bird retaining its position in the flock with never a bird out of place or timing. In these intricate aerial manoeuvres no visible or audible signal is passed, yet all the birds of the flock move as if actuated by one mind and motive.

How is it done? There have been various conjectures, but this remains one of the mysteries of bird life, and it may be that we shall never know the answer. But there are few bird watchers that have not been amazed at this combination of speed and unanimity, and in all the countryside in winter there are few more striking things to see.

THE VETERINARY RECORD
August 11th, 1945

FOOT-AND-MOUTH DISEASE

THE paper presented to the Lancashire Division of the N.V.M.A. by the Chief Veterinary Officer of the Ministry of Agriculture on the epizootiological aspects of foot-and-mouth disease, and reproduced in this issue of *The Veterinary Record*, is both valuable and timely. It describes the administrative experience of the disease, and points the directions to which scientific thought is tending, with the ultimate aim of complete control over the ravages of this disease.

It is universally admitted that the technique adopted by the State Veterinary Service in the field, based as it is upon the slaughter policy of control, is admirable, provided the vital necessity of promptly reporting even the most remotely suspicious cases is recognised by all concerned. It is the envy of other less fortunate countries, and the Ministry can be proud of its long record in this sphere of preventive medicine.

Apart from its value as an up-to-date review, this paper seems to us highly significant at a political level, in that it indicates the determination of those responsible for the administration of this State department to mingle with the rank and file of the profession from time to time, and give us the benefit of their specialised experience. It is not realised as often as it should be that the number of general practitioners who have seen actual cases of foot-and-mouth disease is very small. In most cases those practitioners who have had this experience admit that their knowledge of the course and sequelae of the disease is minimal; it must inevitably be so when State intervention is so thorough, speedy and exclusive. If, as we trust, this address by the Chief Veterinary Officer is but the forerunner of many such divisional addresses by specialists, we would hope that the suggestion that demonstrations of a practical nature be given might be favourably considered. Many of us would welcome the opportunity to examine a series of specimens of lesions encountered in the field, with expert comment thereon. The absence in war-time of the Annual Reports furnished by the Chief Veterinary Officer, must have led to the accumulation of a great deal of information in the files of the Ministry, the release of which to the profession generally could be of great value.

It is impossible to over-emphasise the importance of the slaughter policy which, in the present state of our knowledge, is the only method available in this country. Shortly before the outbreak of war, considerable progress had been made in European countries in limiting the ravages of the disease, but the epizootic which before the war swept the Continent from the south of France to Sweden in a few months, shattered years of patient work and showed that unless constant vigilance is exercised no measures will be effective in arresting outbreaks. It is to be hoped that the *Office international des Epizoöties* or some world-wide organisation of a similar nature will become functional at the earliest possible moment and will decide that the control of foot-and-mouth disease is a problem of the utmost urgency.

In the meantime, there can be no relaxation in the intensive research on foot-and-mouth which is being undertaken in this country and elsewhere. The control of the disease by preventive inoculation may be the ultimate aim of these researches. Although the problem is most complex, substantial progress has been made, but a safe and effective method has yet to be devised.

CLINICAL COMMUNICATION

Recurrent Tetany in the Dog

R. H. SMYTHE, M.R.C.V.S.,
NOTTINGHAM

The condition herein described is well known but its aetiology has always been regarded as obscure. Recurrent tetany is almost wholly confined to Scotch terriers and is becoming so common that it is often referred to by breeders as "Scotch cramp." It, or an indistinguishable condition, has been observed by the writer once in a black cocker bitch and once in a wire-haired terrier dog. It affects both sexes but, allowing for the preponderance of males, it appears to be more common in dogs than in bitches. In the latter, it may appear for the first time a few days after the first parturition and may then be confused with eclampsia or calcium deficiency. In both dogs and bitches the condition seldom appears before the sixth month and may not evidence itself until the animal has reached the 18th month. In a few cases it has occurred in dogs of three years old in which no history of a previous attack could be obtained.

Symptoms.—These vary in intensity. In mild cases the dog, apparently normal at home, when taken for a walk becomes increasingly stiff, usually in the hind limbs, occasionally in all four. Sometimes the rigidity involves only the back and neck. Progression is carried out in a series of hops, the limbs become fixed in a position of flexion and the animal falls on to the side or back and may remain unable to stand for minutes or hours.

In extreme cases the symptoms may persist without intermission for several days at a time and may reappear after an interval of days or weeks.

On palpation, a marked contraction or cramp will be felt in groups of muscles, principally in the flexors of the limbs and particularly in the muscles at the back of the thigh.

The writer has kept a number of cases under observation and has come to the following conclusions :—

The condition is not dependent upon mineral imbalance. In a number of blood samples taken during the course of an attack the calcium, magnesium and phosphorus content has proved invariably to be normal. Neither injections of calcium borogluconate nor of magnesium sulphate have influenced the course of the malady. Injections of parathyroid extracts have proved valueless. The symptoms can be diminished or abated by the administration of phenobarbitone in dosage of two grains, followed by a half to one grain at twelve-hourly intervals. In most cases further attacks do not appear whilst the animal is receiving one grain of phenobarbitone daily, the dosage being reduced if or when symptoms of inco-ordination appear.

The condition appears to be a neurosis and a recessive character which is hereditary. It has been introduced in certain blood lines and is perpetuated by stud dogs of certain strains. By tracing pedigrees and from information gathered from breeders, it has been found that the neurosis occurs in the second generation and follows Mendelian principles. When a normal bitch is mated to a dog bred from a "cramp" sire, the puppies may remain normal but a proportion of the male offspring of a bitch puppy so bred will develop the condition during their lifetime. If a "cramp" bitch is mated to a normal dog the symptoms will probably appear in females of the second generation. When "cramp" exists on both sides, then all the puppies are liable to become affected. Normality is to be regarded as dominant and the tendency to cramp as recessive.

AGRICULTURAL ATTACHE IN WASHINGTON

Professor Robert Rae, agricultural attaché at the British Embassy in Washington and agricultural adviser to the High Commissioner for the United Kingdom in Canada, will soon be returning to this country. He will be succeeded by Mr. A. N. Duckham, who has been serving as director of the supply plans division of the Ministry of Food, having joined that department at the beginning of the war. Mr. Duckham has travelled extensively in Europe and North America on the economics of animal husbandry. He acted as adviser to the United Kingdom delegation to the Hot Springs Food and Agriculture Conference in 1943 and was a member of the Food and Nutrition Committee of the interim Commission set up by that Conference and also Chairman in the United Kingdom of the 1943 Food Consumption Levels Enquiry Committee of the Combined Food Board.

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His successor will find his task the easier because of Mr. Hudson's genius for co-ordination, his drive for efficiency and his legacy of an industry better organised for intensive production than ever before. . . . Mr. Hudson made history not only by length of service but by his courage and foresight.—*Farmer and Stock-Breeder.*

ABSTRACTS

[Veterinary and Medical Control of the Milk Supply. Discussion. *Proc. Roy. Soc. Med.* **38**. 253-26.]

In this discussion representatives of the veterinary and medical professions met together with representatives of dairy farmers.

Mr. H. T. MATTHEWS opened the discussion and referred to the control of milk supplies. He said that no scientist can control from without and, quite frankly, he thought that if veterinary surgeons had been placed in charge at the distributing end with authority to work all the way back to the farm it would have proved of all-round benefit during the last 25 years.

Reviewing the Government policy as expressed in a White Paper in July, 1943, and given parliamentary sanction in the Food and Drugs (Milk and Dairies) Act, 1944, he said it explicitly states that the Ministry's veterinary staff will have responsibility for the conditions under which milk is produced; it is certain that this will create a more personal touch than medical officers of local authorities have been able to apply.

Mr. Matthews then spoke of tuberculosis and brucellosis, which were cattle diseases of such economic importance to agriculture that their control or elimination is called for quite apart from their relationship to human health.

Routine herd examinations for tuberculosis must be more frequent and regular than at present, but the use of tuberculin was making progress.

Brucellosis vaccination with an American strain of the organism is proving popular; it was, however, too early yet to say what eventual effect it would have on the disease, but the indications are favourable. He emphasised that an all-out attack upon these two diseases will not be practicable until the veterinary profession is of greater strength.

Mr. Matthews, continuing, said that there was no good evidence that mastitis of the cow was a human health menace. The legislation forbidding the sale of milk from cases of mastitis appears to be based upon the fact that such sale is "prejudicial to the purchaser," but not upon any demonstrable transmission of infection from cows to human beings. He thought the law not well observed; it was obscure and not capable of enforcement.

He thought, too, that diseases of dairy cattle could be taken right out of public health legislation and transferred with modifications into measures benefiting the farmer as a producer of an agricultural commodity instead of as a purvevor of human food.

If the White Paper policy is implemented he expected that the function of the veterinary staff of the Ministry will be supervisory and administrative rather than executive. A very large part of the work would fall within the province of veterinary science and veterinarians, along with other technicians, would co-ordinate into a team.

Mr. Matthews then referred to the need for a substantial improvement in the dairy cow population and finished by speaking of the great detail and complexity of daily routine on the dairy farm: the producer required a great variety of technical help. Various factors are often said to be the key to the control of the industry, but effective control can only come from within and no single body or science can handle them all. The most effective control will be an economic one.

Dr. W. A. LETHEM said that there are 1,500 local authorities interested in milk, but while an authority like the L.C.C. is responsible for some 30 farms, many a rural district council is expected to control anything from 600 to 1,000. Therefore it seems that supervision is least efficient where it is most wanted.

Years ago more attention was given to the production of "clean" milk, the lay mind assuming that cleanliness meant safety. The term "clean" is misleading and is often used in place of "fresh," as souring is caused less by physical dirt than by lactic acid producing organisms.

The introduction of T.T. and pasteurised milk was an upward step. Accredited milk, curiously enough, is found to show a higher percentage of diseased samples than ordinary milk. Dr. Lethem thought that this may be due to accredited farmers having on the whole larger herds and hence to a larger quantity of bulked milk being infected from a single diseased cow. T.T. milk is on the whole free from tubercle, but not necessarily free from undulant fever or mastitis organisms.

At one time it was thought that coliform organisms indicated contamination with manure, but it is now known that this is not so but usually indicates faulty sterilisation of churns or vessels.

The count test is very misleading. Correctly pasteurised milk often shows high counts from non-pathogenic heat-resisting organisms which have little effect on keeping quality. The phosphatase test is the only really efficient test of pasteurisation. Testing for pathogenic organisms, for example tubercle, is slow, with a wait of four or six weeks after the inoculation of the guinea-pig.

Dr. Lethem thought that medical officers of health lack adequate legal powers. The sale of milk can be stopped if believed to be infected with a human notifiable infectious disease, but not with tubercle, undulant fever or mastitis, except to a school under their own control.

Mr. Clyde Higgs declared that the average farmer was suspicious of the present-day interest displayed by both the medical and veterinary professions in milk production. The many interests in the dairy farmers' efforts confused him. For example, why a tested herd should produce milk of no particular standard of cleanliness or why milk from the same cow according to its travels should reach the consumer under many different designations. He maintained that the efficient control of the milk supply was the first step towards improvement of the country's livestock.

Until recently he had opposed pasteurisation but had now changed his opinion and had decided to pasteurise his good milk and make it better still.

Dr. T. Richards stressed the need for good animal hygiene and husbandry. Diseases still persist and in the absence of the veterinarian his advice and instructions are not carried out and those who handle the milk are often completely lacking in any sense of hygiene.

Dr. C. Fraser Brockington spoke of the need for educational facilities amongst farm workers and said that more use should be made of films in the country districts. He thought all persons engaged in milk production should be registered if the milk is to be sold raw and medical examination should be carried out to eliminate dangerous carriers.

Mr. J. S. Steward said that microscopical examination of milk samples for evidence of udder tuberculosis was remarkably reliable. Up to 94 per cent. were detected microscopically as checked by biological testing. Clinical examinations would miss up to 50 per cent. of cows giving tuberculous milk (with or without palpable lesions) when checked by biological testing, but when post-clinical bulked milk sampling for biological testing was adopted, excellent results were obtained. He thought that although uterine or glandular discharge might contain large numbers of tubercle bacilli yet in the absence of cough or emaciation such cows could not be controlled under the Tuberculosis Order, 1938. It was time that this Order was amended to include all "open" cases of the disease.

The Ministry should encourage keener inspection of herds by controlling these by biological testing of post-clinical herd samples and providing free initial tuberculin testing.

Mr. H. W. Steele-Bodger was of the opinion that the problem of control of the public milk supply could best be solved if the medical, veterinary and farming professions discussed the measures nationally.

Pasteurisation, he maintained, was not an alternative to or substitute for animal health measures but complementary to them.

Dr. J. T. Edwards referred to the high incidence of tuberculosis in the country making the cost of eradication prohibitive. In the U.S.A. success has been attained by State-wide tuberculin testing, made possible by the low natural incidence of the disease. He thought that local surveys should be made in Britain to find areas of sufficiently low incidence to enable eradication to be carried out.

Dr. Edwards remarked that the only way to make milk "safe" was to boil it immediately before use: he thought that nutritional loss was insignificant and could be made up by other dietary items.

Mr. Matthews, in reply, again stressed his contention that control of milk supply must come from within. Pasteurisation seems no longer to be controversial, but he gave a reminder that it is a commercial device. He agreed that more films should be exhibited to farm audiences and thought that this medium had a future.

F. L.

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[Differential Diagnosis of Respiratory Diseases of Fowl. Delaplane, J. P. (1945.) *J. Amer. vet. med. Ass.* **106**. 83-87. (5 refs.).]

The author, with a view to differential diagnosis, states the symptoms, lesions, age incidence and mortality of laryngotracheitis, coryza due to *Haemophilus gallinarum* and other causes, infectious bronchitis, fowl pox, avian pneumo-encephalitis, chronic fowl cholera and infectious sinusitis of turkeys.

A. W. G.

Food production in Europe in 1945 is expected to be the smallest since the outbreak of war. Tentative international allocations call for the shipment of a substantial quantity of fats and oils out of world supplies to continental Europe, excluding Russia, in 1945.

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"Ghastly" was the description applied by Mr. C. Brown, at a meeting at Aylesbury, in regard to water and electricity supplies for Bucks farms, and the County F.U. agreed that a special committee meeting should be called to consider the position.

Questions and Answers

"Questions and Answers" will be published on alternate weeks.

The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Repellent Dressing Against Flies

Q. XCVII.—*Can you suggest an effective repellent dressing for application to the udder of a milking nanny goat which is severely attacked by biting flies during the summer? She is the only animal so affected and her milk is used solely for feeding kids.*

A.—The problem of preventing irritation and "strike" by flies is one which needs much more investigation and is, at the moment, in a very unsatisfactory state. Even the best repellents, such as the cresol preparations, have but a short-lasting effect.

In the case under consideration, the udder should be washed with soap and water at fortnightly intervals, as it may be the smell of the skin, as much as anything, that attracts the flies. Any cuts or sores should also be dealt with. If the kids run constantly with the nanny the problem is more difficult, as a strong odour may interfere with suckling. A good plan would be to allow the kids to suckle at regular intervals and rub oil of citronella or oil of white birch on to the udder each time, avoiding the teats. Wipe udder with a clean cloth before suckling, if kids show any signs of hesitation.

. . . . .

Ruminant Digestion

Q. XCVIII.—*If wheaten straw is chopped, mixed with pulped mangold, damped with treacle water and allowed to ferment for at least 24 hours, a milk cow will digest it. If the wheaten straw is fed without being chopped along with pulped mangold in the manger, a milk cow will suffer from indigestion. What is the explanation?*

A.—On purely physiological grounds the mixture of chopped wheat straw and pulped mangold when allowed to ferment with treacle water would be more readily digestible than if these substances were fed without previous fermentation having taken place. Pulped mangolds and wheaten straw, however, constitute a standard ration for many yarded animals and is not generally regarded as being the cause of indigestion. There must be some other explanation if clinical symptoms are observed under this system of management.

. . . . .

Obliteration of the Anal Glands by Injection

Q. XCIX.—*Is there any treatment for the obliteration of the anal glands in the dog by means of injections into the glands via the ducts?*

A.—Yes, a method of obliterating the anal glands of the dog by injection of a sclerosing fluid *via* the duct was described by Auchterlonie (*Vet. Rec.*, January 24th, 1942, p. 51). The method described utilises a fluid of the following prescription:—

Ferric chloride	1 drachm.
Glacial acetic acid	1 c.c.
Absolute alcohol	6 c.c.
Chloroform	3 c.c.

The fluid is injected by a Horrock's fine blood cannula (which is all silver) attached to a 5 c.c. all glass syringe by a rubber adaptor.

Narcosis or anaesthesia is required for this operation to relax the anal sphincter so that the openings of the gland ducts may be located and entered. Morphine is recommended but the writer finds pentothal sodium the ideal anaesthetic for this operation; about five minutes' anaesthesia will suffice.

In the writer's hands this method has proved almost spectacular in its results. Only in one case has there been any after effect and this was localised suppuration in the one gland, pointing at the skin surface, which cleared up rapidly with complete obliteration of the gland. Dogs which have been a misery to themselves and an offence to their owners have been relieved of all irritation and pain and have become pleasant companions.

The method is simplicity itself and so has great advantages over the difficult and unsatisfactory operation for excision of the anal sacs.

It may be of interest to note that in a recent case of sub. lingual salivary cyst in a dog in which incision and removal of as much of the cyst lining as was accessible proved a failure the rapid application of a swab soaked in this fluid after incising the cyst has apparently provided permanent cure with little or no discomfort to the dog.

Treatment of Stubborn Acne

Q. C.—*Can you suggest a treatment for the stubborn condition of acne which is sometimes encountered on the nose and forehead of dogs, especially spaniels?*

A.—It is assumed that the possibility of demodex infection in these cases has been eliminated by the microscopical examination of pus or scrapings and that the lesions although primarily an occlusion of sebaceous gland ducts, are almost certain to be associated with staphylococcal infection.

In such cases the treatment suggested is the subcutaneous injection of staphylococcus toxoid coupled with the daily application to the lesions of a 1 per cent. gentian violet either in the form of a jelly or solution.

In the writer's experience a chronic case requires at least five or six injections of toxoid at two to three days intervals, the suggested graduation of dosage in the average spaniel being 1 c.c., 2 c.c., 4 c.c., 5 c.c., repeating the 5 c.c. dose several times if necessary.

Occasional cases of severe local or general reaction may occur during the administration of toxoid, in which event the dose causing the reaction should not be exceeded at the next injection. A mild reaction on the largest dose is almost invariable.

In acne cases of very long standing it is sometimes desirable to cauterise the individual lesions with silver nitrate at the outset of treatment. Periodic thorough cleansing with soap and water, by its mechanical removal of debris and sebum, will be found a useful adjunct.

In cases which prove to be resistant to the suggested lines of treatment it may be found advisable to try out certain of the sulphonamide preparations in cream or ointment form, as occasionally dogs will respond in a spectacular manner to this line when other methods fail; useful preparations for this are: Soluseptasine ointment (May & Baker), Sulphamezathine cream (I.C.I.) or "Uleron" ointment (Bayer).

* * * * *

Correspondence

Bovine Acetonaemia

Sir,—I read the answer to the question on bovine acetonaemia with interest and some disappointment; it does not seem to me fair to the work of Mr. Messervy, of Dr. Green, or of Dr. Barron to dismiss the subject with the statement that "little is known of bovine ketosis." I am sure that any of the above could, and I hope will, furnish us with a concise but comprehensive account of what is known of the aetiology of acetonaemia—with reference also, perhaps, to the use of choline chloride in its treatment. This latter treatment, based I believe on the assumption that acetonaemia is due to a disturbance of the glycogen-storing function of the liver, appears most successful even in cases where the usual glucose injections have failed.

Yours faithfully,

Chipping Norton, Oxon. PAUL CROSFIELD.
July 25th, 1945.

"Felon" of Cattle

Sir,—Ref. Question No. 89, June 30th, *re* "joint felon" in cattle:

This is a pyaemia found in cattle after calving but not always immediately after. The source of the infection is the uterus either after a bad calving case or when the afterbirth has been removed from the cow too soon or too late and then the infection takes place. There are two kinds of "felon": one a "joint felon" which affects the joints, chiefly the hock and stifle joints and occasionally the hip (presumably because the seat of the infection is at that part of the animal) and a "felon" which affects the muscles and again chiefly those in the hind limbs although cases are found with it in the shoulder muscles.

Be most careful about cleansing your cows—douche them out well with a reliable disinfectant. Give them a dose of vaccine against such an infection and you can also, if you deem it advisable, dose with sulphanilamide.

Yours faithfully,

Eastwick House, G. C. LANCASTER.
Evesham, Worcs.

Weekly Wisdom

". . . Never refuse to see what you do not want to see or what might go against your own cherished hypotheses, or against the views of authorities. These are just the clues to follow up, as is also, and emphatically so, the thing you have never seen or heard of before. The thing you cannot get a pigeon-hole for is the finger-point showing the way to discovery."—Sir Patrick MANSON ("The Father of Tropical Medicine")—advice given to a young man in 1909. [*Trans. Roy. Soc. Trop. Med. & Hyg.*, 1945, **38**, 417.]

ROYAL COLLEGE OF VETERINARY SURGEONS

Membership Examinations, July, 1945

List of Successful Candidates

(*Concluded*)

Dublin

Second Year:

Coghlan, M. J.
Connor, P. J.
*Fennelly, P. W.
*Loughlin, D.
*McIvor, J. G.
O'Connor, Daniel
*O'Hare, O. C.
O'Reilly, G. M. B.
O'Sullivan, C. B.
Sweeney, E. J. (H)
Walsh, E. A.
*Warmington, J. C.
Woulfe, M. R.

* denotes 2nd Class Honours.
(H) denotes credit in Histology.

Third Year:

Adams, E. K.
Alford, G. A.
Bradbury, Miss J. M.
Corcoran, J. F. (H)
Devereux, J. A. (A)
*Dineen, Joseph
Farrell, Joseph
Farrell, T. M.
Ferguson, Miss M. D. R.
Forde, L. P. (P) (H)
Gallagher, P. M.
Gormley, P. D. (H)
Higgins, J. P.
Keane, Cornelius (A)
Lynch, T. J.
McCann, W. J.
McNamara, E. J.
Martin, H. (H)
Murphy, John
O'Gorman, David (A)
O'Rourke, J. J.
*Prendergast, W. J.
Redeham, Bernard
Richards, R. D.
*Shiel, J. C.
Skuse, H. G. (H)
Timmons, E. H.
Tubridy, M. S. (H)

* denotes 2nd Class Honours.
(P) denotes credit in Pharmacology, etc.
(A) denotes credit in Anatomy.
(H) denotes credit in Hygiene, etc.

Fourth Year:

Casserley, Patrick
Coard, E. F.
Cremin, C. J.
Daly, P. J. (Paras)
Erskine, R. G.
*Finn, J. J.
Greenwood, J. J.
Hutchinson, R. W. (Paras)
Kelly, W. H. B.
Lynch, Richard (Paras)
McDermott, M. J.
McDonald, Robert
McGettigan, C. J.
McNally, G. K.
Maher, K. J.
Moffitt, T. F.
Monaghan, D. H.
Moore, George
Moorhead, P. J.
Murphy, T. (Palatine) (Paras)
Murphy, T. (Dublin)
*Nicholson, J. T.
O'Brien, Cornelius
O'Scanaill, T. (Paras)
O'Sullivan, Edward
Quinn, P. G.
Wolohan, J. J.

* denotes 2nd Class Honours.
(Paras) denotes credit in Parasitology.

Final Year:

Barron, J. M.
Buckley, A. R.
Burke, W. L.
Bryson, Hugh
Corcoran, C. J.
Cronin, M. T. I.
Crooks, David
Donnelly, J. G.
Dwyer, A. J.
Farrelly, B. T.
Hamilton, A. H. A.
Hill, H. J.
Jolley, C. T.
Jordan, Hercules
Lawther, J. R.
Lunny, W. J.
Lynch, Vincent
Lyness, Thomas
McBride, P. S.
McCann, P. G.
McCrea, G. H.
McGrenra, D. P.
Maconkey, W. I.
Murphy, M. A.
Nolan, Francis
O'Mahony, C. P.
O'Moore, L. B. S.
O'Shaughnessy, T. N.
Power, P. N.
Richardson, J. P.
Sheahan, Miss M.
Sherriff, R. B
Simpson, T. T. (M)
Sweeney, P. A.
Young, J. A.
Yourell, Miss J.

(M) denotes credit in Medicine.

Judges of dairy cattle have long given attention to the size of surface veins on the udder, the size and tortuousness of the "milk veins" and the size of the milk well as indicative of milk production in the cow. The Bureau of Animal Industry, U.S.D.A., after considerable study of the matter, reached the conclusion that these indices bear little or no relation to the milk production capacity of the animal.—*Vet. Med.*

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Aug. 25th.—Summer Meeting of the Society of Women Veterinary Surgeons at Liverpool Veterinary Field Station, "Leahurst," Windle Hill, Neston), 2.15 p.m.
Sept. 15th.—Applications due for Miss Cust Research Scholarship.
Sept. 19th.—R.C.V.S. Committee Meetings.
Sept. 20th.—R.C.V.S. Committee Meetings.
Sept. 21st.—**R.C.V.S. Council Meetings.**
Sept. 25th.—**N.V.M.A. Council and Committee Meetings.**
Sept. 26th.—**In connection with N.V.M.A. Annual Meeting—Paper: "Achievements of the Army Veterinary and Remount Services during the War" (Morning).**
N.V.M.A. Annual Luncheon, Connaught Rooms, W.C.2, 1.15 p.m.
President's Reception, Dorchester Hotel, Park Lane, W.1, 8.30 p.m.
Sept. 27th.—**Paper: "War-time Achievements of the Colonial Veterinary Service" (Morning).**
Annual General Meeting, N.V.M.A., The Grand Hall, Royal Veterinary College, N.W.1, 2 p.m.
Sept. 28th.—**N.V.M.A. Council Meeting, 10 a.m.**

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PERSONAL

Birth.—On July 21st, 1945, at Rubislaw Nursing Home, Aberdeen, to Cecilia Johnston, B.SC., M.B., CH.B., wife of R. W. Johnston, M.R.C.V.S., Longside—a son.

. . . . . .

Forthcoming Marriage.—PULLON—HARVIE.—The engagement is announced between Ivor B. Pullon, M.R.C.V.S., Colonial Veterinary Service, Tanganyika Territory, and "Zana" W. Harvie, of Airdrie, Scotland.

. . . . . .

Marriages.—GAMBLES—MCCLINTOCK.—At St. George's Church, Troodos (Mount Olympus), Cyprus, on July 28th, by the Venerable Archdeacon M. L. Maxwell, M.A., Robert Moylan Gambles, M.A., B.SC., M.R.C.V.S., F.R.E.S., Colonial Veterinary Service, elder son of Mr. and Mrs. Robert Gambles, of Cobham, Surrey, to Margaret Ethel McClintock, third daughter of Rev. and Mrs. E. L. L. McClintock, St. Mary's Vicarage, Platt, near Sevenoaks, Kent.

WHITE—YOUNG.—At St. George's Church, Dumfries, on July 28th, 1945, by the Rev. H. J. Marr, of St. Andrew's Church, Ayr, Philip Herbert (Sub-Lieutenant, R.N.V.R.), elder son of Mr. and Mrs. E. T. White, of Grimsby, to Nancy Eileen, W.R.N.S., only daughter of Mr. Andrew Young, M.R.C.V.S., and Mrs. Young, 48, Rae Street, Dumfries.

. . . . . .

Will.—KING, Mr. William Samuel, M.R.C.V.S., of Burdett Road, E., £22,777.

* * * * *

R.C.V.S. OBITUARY

EVANS, John Thomas, Capt. R.A.V.C., Ballycan House, Mount Nugent, Co. Cavan, Eire. Graduated Dublin, December 14th, 1911. Died July 25th, 1945.

* * * * *

NEW MINISTERS

Among the appointments to Ministerial office made by the Prime Minister, the following are of special interest to members of the profession in virtue of the work of the department concerned:—

The sense of loss to agriculture felt by the members and associates of the industry in the departure of Mr. R. S. Hudson, whose success in his post was acclaimed universally, will be mitigated by the appointment of Mr. Tom Williams, a much-respected figure in Parliament who has had five years' experience as Under-Secretary at the Ministry. His appointment will be well received among the farming community. The Ministry of Health goes to that most persistent critic of other Governments, Mr. Aneurin Bevan—an outstanding instance of "poacher turned gamekeeper"—who follows Mr. Willink. The new Secretary for the Colonies, in succession to Colonel Stanley, is Mr. George Hall, who was Under-Secretary for the Colonies from May, 1940, until he went to the Admiralty as Financial Secretary early in 1942. From 1943 until the Coalition ended he was Under-Secretary for Foreign Affairs. Lord Addison, a former Minister for Agriculture, and who now becomes Leader of the House of Lords, has been given the office of Secretary of State for Dominion Affairs.

A B.M.A. LANDMARK

Congratulations to our great counterpart in professional organisation, the British Medical Association, on the recently announced attainment of a membership of over 50,000. A tabular statement of numerical progress shows a remarkably steady accession of strength since its foundation in 1832, and well indeed have the "objects of the Association" propounded by Dr. (later Sir Charles) Hastings and his colleagues stood the test of time. The N.V.M.A. itself may derive much encouragement from such evidence of the accepted value of corporate aims and activities amongst members of the sister profession.

* * * * *

SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

STATEMENT SHOWING THE NUMBER OF UNDERTAKINGS NOTIFIED TO THE MINISTRY OF AGRICULTURE DURING THE MONTH ENDED JULY 31ST, 1945

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
ENGLAND					
Bedford	—	39	39	955	603
Berks	—	95	95	3,246	2,059
Bucks	1	97	98	3,210	1,920
Cambridge	—	13	13	334	192
Chester	—	390	390	12,831	4,581
Cornwall	—	4	4	72	75
Cumberland	—	63	63	1,603	1,359
Derby	1	334	335	9,564	5,394
Devon	3	305	308	4,556	2,733
Dorset	—	67	67	2,101	1,123
Durham	4	282	286	6,246	2,472
Essex	—	246	246	8,827	5,179
Gloucester	1	96	97	2,831	1,670
Hampshire	2	380	382	10,733	7,539
Hereford	—	18	18	339	216
Hertford	3	78	81	2,466	1,532
Hunts	—	13	13	475	302
Isle of Ely	—	2	2	58	29
Isle of Wight	—	14	14	252	127
Kent	1	170	171	4,279	2,531
Lancs	—	195	195	5,677	1,828
Leics	1	104	105	2,621	1,924
Lincs (Holland)	—	3	3	25	11
Lincs (Kesteven)	—	23	23	320	168
Lincs (Lindsey)	—	108	108	2,067	1,187
Middlesex	—	15	15	611	291
Norfolk	—	189	189	5,678	3,939
Northants	—	82	82	2,309	1,789
Northumberland	—	65	65	2,154	1,210
Notts	2	178	180	3,931	2,395
Oxford	—	45	45	1,237	1,087
Rutland	—	8	8	156	107
Salop	2	262	264	7,864	3,884
Soke of Peterborough	—	1	1	37	31
Somerset	3	243	246	6,510	3,060
Staffs	3	206	209	6,159	3,625
Suffolk, E.	—	88	88	2,092	1,507
Suffolk, W.	—	48	48	1,010	622
Surrey	—	103	103	3,004	1,414
Sussex, E.	1	179	180	4,550	2,712
Sussex, W.	—	112	112	3,217	1,944
Warwick	1	135	136	3,317	2,131
Westmorland	—	13	13	354	444
Wilts	—	90	90	3,612	1,870
Worcester	4	155	159	3,247	1,618
Yorks, E.R.	—	104	104	1,625	943
Yorks, N.R.	—	117	117	2,381	1,490
Yorks, W.R.	—	252	252	6,143	2,464
WALES					
Anglesey	—	49	49	868	623
Brecon	—	8	8	174	105
Caernarvon	—	110	110	1,721	954
Cardigan	—	29	29	550	393
Carmarthen	—	248	248	4,476	2,326
Denbigh	—	43	43	878	461
Flint	—	114	114	2,545	1,141
Glamorgan	—	105	105	1,729	717
Merioneth	—	9	9	117	55
Monmouth	—	54	54	1,272	713
Montgomery	—	15	15	294	233
Pembroke	—	73	73	1,453	1,039
Radnor	—	—	—	—	—
TOTALS	33	6,686	6,719	172,972	96,691

Notes.—(1) Operative periods of undertakings: 1 year, 1,200; 2 years, 501; 3 years, 5,018. (2) Undertakings renewed for a further period: 1 year, 1,10[illegible] 2 years, 196; 3 years, 263. (3) Undertakings not renewed at end of operiod, 875. (4) The figures showing the number of undertakings notifi the month relate to entirely fresh undertakings and do not include u. renewed for a further period. Undertakings which have been cancel renewed are not included in the figures for previous notification.

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
SCOTLAND					
Aberdeen	2	19	21	885	295
Angus	—	21	21	838	395
Argyll	—	6	6	113	115
Ayr	—	26	26	843	624
Banff	—	3	3	93	42
Berwick	—	2	2	53	22
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan ..	—	7	7	301	262
Dumfries	—	14	14	777	710
Dumbarton	—	3	3	105	86
East Lothian	—	3	3	145	88
Fife	—	36	36	1,349	703
Inverness	—	8	8	324	191
Kincardine	—	3	3	127	83
Kinross	—	3	3	56	40
Kirkcudbright ..	—	13	13	837	612
Lanark	—	19	19	730	549
Midlothian	—	1	1	44	69
Moray	—	—	—	—	—
Nairn	—	1	1	14	—
Orkney	—	—	—	—	—
Peebles	—	2	2	28	16
Perth	—	29	29	697	431
Renfrew	—	7	7	277	201
Ross-shire	—	2	2	58	52
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	—	29	29	931	780
Sutherland	—	5	5	104	76
West Lothian	—	1	1	23	18
Wigtown	—	27	27	1,783	1,030
Zetland	—	—	—	—	—
TOTALS ..	2	290	292	11,535	7,490

Notes.—(1) Duration of undertakings: 1 year, 36; 2 years, 12; 3 years, 244. (2) Undertakings renewed for a further period (included in column 2 of statement): 1 year, 38; 2 years, 6; 3 years, 10. (3) Undertakings expired and not renewed (not included in column 2 of statement): 91. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings.

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ADDRESSES OF DISEASE-INFECTED PREMISES

FOOT-AND-MOUTH DISEASE:

Surrey.—Ford Farm, Old Woking, Woking (Aug. 2nd).

SWINE FEVER:

Essex.—Nevendon Villa, Gardiners Lane, Basildon, Billericay (July 31st).

Herts.—Rudwick Hall Farm, Kimpton, Hitchin (Aug 3rd).

Leics.—Nottingham Road Nurseries, Melton Mowbray (Aug. 4th).

Midlothian.—South Medwyn Bank, South Gyle Road, Corstorphine, Edinburgh (Aug. 1st).

Worcs.—Holyoake's Farm, Tardebigge, Bromsgrove (Aug. 4th).

* * * * *

CAPRINE BRUCELLOSIS IN THE UNITED STATES

Having a relatively minor goat breeding industry, caprine brucellosis was late in attracting general attention in the United States. Only isolated reports of the disease in goats and its potentiality in human health are on record. The disease, however, has long been known and feared, for in 1905 a shipment of 65 goats from the island of Malta was quarantined, rejected and destroyed due to having been found to have brucellosis. A few weeks later eight members of the ship's crew who had drunk the milk of these goats developed undulant fever. In 1911, twelve human cases were diagnosed in Texas, where 19·4 per cent. of a herd of 128 goats were found to be infected with *Brucella melitensis*, and in 1922, the U.S. Public Health Service recognised 35 human cases in Phoenix, Arizona, which were found to have been caused by the drinking of goats' milk. In 1923, state veterinarian W. A. Stevenson, of Utah, died of undulant fever contracted by handling the after-births of Brucella-infected goats. In 1934, Giltner, of the U.S. Bureau of Animal Industry, following an investigation in the south-western states, pronounced caprine brucellosis a potential menace to public health. The 3,636 unclassified human cases in the south-west, tabulated by the U.S. Public Health Service for the year 1943, supported the prediction. Of these, 339 were in Texas, 244 in California, 40 in Colorado, 26 in Oklahoma, and the rest scattered in the west and south-west.

A survey of cheese making from goats' milk in Colorado, wherefrom a sizable industry sprang, revealed interesting facts about the incidence of infective cheese derived from the lowly bred and badly managed "brush goats" of that region. Of 19 cheese samples examined by the U.S. Bureau of Animal Industry, eight were positive for brucellosis when injected into guinea-pigs.—Abstracted from the *Proceedings*, Colorado State Medical Society, 1944, by *Veterinary Science Newsletter.*

A national apprenticeship scheme for shoeing smiths is under consideration. The proposals include training at a technical school with the opportunity of passing various trade tests. Some counties already have schemes in existence. Where these are run on the general outline of the national scheme, counties will be allowed to build them up to suit their own needs.—*Farmers' Weekly.*

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

* * * * *

MANGOLD POISONING (?) OF PIGS

Sir,—I was interested to read in your issue of July 14th a report of mangold poisoning of pigs in New Zealand. It brought to mind a case which puzzled me considerably at the time and which may have its explanation in that article.

In this case pigs belonging to a mental hospital were being fed cooked hospital swill containing beetroot tops and also sprouting mangolds taken from a clamp. The food was cooked and allowed to stand overnight and was fed on the following day mixed with a proprietary pig meal.

The symptoms noticed were staggering and collapse immediately after feeding, followed in most cases by death within an hour. Some pigs which vomited immediately, recovered after lying for hours in a dazed condition.

The only outstanding *post-mortem* features were gastritis and non-coagulation of the blood which was a chocolate colour.

Samples of the swill, stomach, and stomach contents were submitted for chemical analysis without result. This may have been due to the fact that some long delay was encountered at the laboratory, the specimens being placed in cold storage before analysis was undertaken.

At the time I thought the condition was due to oxalic acid poisoning from the beetroot tops and sprouting mangolds, but the conversion of nitrates to toxic nitrites by enzymic action is a distinct possibility.

There were no further deaths when the mangolds and beetroot tops were excluded from the swill.

Yours faithfully,

JOHN MCLINTOCK.

42, Prince of Wales Road,
Norwich.
July 28th, 1945.

* * * * *

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
July 1st to 15th, 1945 ...	5	13	—	6	34
Corresponding period in—					
1944 ...	2	—	—	—	53
1943 ...	7	—	—	1	23
1942 ...	16	29	—	1	15
Total Jan. 1st to July 15, 1945	59	98	5	46	542
Corresponding period in—					
1944 ...	113	27	6	61	471
1943 ...	171	10	6	101	281
1942 ...	188	74	26	118	247

NOTE.—The figures for the current year are approximate only.
*** Excluding outbreaks in Army Horses.**

Tuberculosis Order of 1938

The number of bovine animals slaughtered under the Tuberculosis Order of 1938 during the period April 1st to June 30th, 1945, was 2,793.